

**ANALYZING TEXT MESSAGES REGARDING ADOLESCENT SEXUAL
HEALTH**

by

Sarah McDaniel

A paper presented to the faculty of The University of North Carolina at
Chapel Hill in partial fulfillment of the requirements for the
degree of Master of (Master of Science in) Public Health
in the Department of Maternal and Child Health.

Chapel Hill, N.C.

April 4, 2015

Approved by:

(

✓

Advisor

Reader

Abstract

Sexual and reproductive health during adolescence has been historically overlooked in education, policy, and research. The United States has one of the highest rates of STI transmission and pregnancy among teenagers of developed nations, underscoring the need for comprehensive sexual health information available to teens. Barriers such as embarrassment and perceived lack of confidentiality prevent adolescents from seeking answers to questions about sex, development, and relationships from parents and medical professionals. Services that provide information in a text message format can overcome these barriers. BrdsNBz is a two-way text messaging service that allows adolescents to send anonymous questions to trained health educators who provide personalized, confidential, and factually accurate answers to questions regarding sexual health. This analysis coded the 2,171 text messages that were sent to BrdsNBz North Carolina from January 1, 2012, to December 31, 2014. Text messages regarding contraception, pregnancy, and relationships were further sub-coded to understand what concerns about sexual health and related topics from adolescents ages 13 to 19 years old in North Carolina.

Introduction

Health, as defined by the World Health Organization, is “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (World Health Organization, 1946). Sexual and reproductive health is an integral aspect of overall health, and therefore merits the same definition. Despite the role adolescence plays in the development of sexual and reproductive health in

adulthood, teenage sexuality has been historically overlooked in education, policy, and research.

Adolescence, usually defined as the ages between 13 and 19, is marked by puberty, increased sexual interest, and the development of sexuality (DeLamater and Friedrich, 2002). Often, sexual experiences during adolescence shape sexual health during adulthood. Most obvious are the effects of sexually transmitted infections (STIs) and the Human Immunodeficiency Virus (HIV), teen pregnancy, and sexual coercion that can last long into adulthood.

For example, while teens comprise only one fourth of the sexually active population in the United States, they account for about half of STIs contracted annually, approximately 10 million infections among this population. They also account for 25% of the 50,000 new HIV infections each year (CDC, 2013; Weinstock, Berman, & Cates, 2004). In addition, while teen pregnancy and teen birth rates have been on the decline, the U.S. still has the highest teen birth rate of any developed country (National Research Council, 2013). The Centers for Disease Control and Prevention (CDC) reports that nearly 1.5 million high school students are affected by dating violence annually, with sexual coercion especially high among lesbian, gay, bisexual, transgender, and questioning (LGBTQ) youth and young women (CDC, 2006). Sexual violence negatively impacts self-esteem and self-efficacy in sexual decision-making and can lead to mental health disorders such as depression and post-traumatic stress disorder (CDC, 2014).

Less obvious are the effects of perpetuating gender stereotypes and an exclusion of sexual minorities from sexual health education. Sexual health education in the United

States has historically focused on disease and pregnancy prevention through abstinence only until marriage (AOUM) education (Shalet, Santelli, Russell, Halpern, Miller, Pickering, Goldberg, & Hoenig, 2014). AOUM programs have proven to be ineffective in delaying sexual debut, preventing STI transmission, and reducing teen pregnancy (Stranger-Hall & Hall, 2011; Ott & Santelli, 2007). In addition, they are heterosexually biased in that they promote abstinence only until heterosexual marriage.

In 2010, the teen pregnancy prevention initiative required federally funded programs to be based on scientific evidence, called evidence-based interventions (EBI). While an obvious improvement in sexual health education, current EBIs continue to focus on disease and pregnancy prevention. In addition, they often exclude information regarding sexual orientation (Shalet, et al., 2014). Such information is critical for adolescent sexual health, as defined by the WHO. For example, hetero-normative programs may promote condom use among heterosexual partners to prevent STI transmission, but not explain that condom use is important for STI prevention among same-sex partners.

In addition, many EBIs fail to challenge gender inequalities that affect STIs, HIV/AIDS, unintended pregnancies, and sexual violence among youth. The sexual double standard, or the celebration of heterosexual sexual experience for boys and stigmatization of sexual experience in girls, negatively impacts both girls and boys. Stigmatization of sexual desires in girls reduces their negotiating power and skills in sexual experiences resulting in a reduction of condom use and an increase in unwanted sexual experience. The converse is also true in that girls who feel entitled to sexual pleasure and with more sexual self-efficacy are more likely to engage in safer sexual

behaviors (Shalet, et al., 2014). The sexual double standard harms boys in that they are encouraged to engage in heterosexual sex even when it is risky. Boys that have more traditional masculine attitudes report having more sexual partners and a decrease in condom use, which can result in STI transmission and pregnancy (Shalet, et al., 2014).

This information underscores the need for honest, comprehensive sexual education that is inclusive of sexual minorities and promotes gender equality. However, discomfort with adolescent sexuality prevents educators, medical professionals, and parents from providing this information. Similarly, barriers such as embarrassment, concerns about cost, perceived lack of confidentiality, and lack of access prevent many teens from seeking information about sensitive topics from parents, medical professionals, and educators. (Ackard & Neumark-Sztainer, 2001; Perry, Kayekjian, Braun, Cantu, Sheoran, & Chung, 2012; Rideout, 2002). These two perceptions provide little opportunity for parents, providers, educators, and youth to communicate about sexual health.

Instead of seeking information from medical providers or parents, teens often turn to other sources for sexual health information. A recent study found that about 44% of adolescents obtained information about pregnancy, birth control, HIV/AIDS, and other STIs from the Internet (Rideout, 2002). Although the perceived reliability of information found on the Internet is relatively low—only 17% would trust the Internet “a lot”—teens rely on the information due to perceived confidentiality; 82% say protected confidentiality is very important to them (Rideout, 2002). Rideout also found that adolescents preferred the ability to ask specific questions, find information easily, and to hear different sides of an issue, all of which are possible through the use of the Internet

(2002). However, the Internet has a relatively low perceived reliability for a reason. It *can* be an unreliable source with regard to accuracy of information. In addition, many teens report being blocked from certain sites when searching for sexual health topics such as HIV, other STIs, sexuality, and contraception (Rideout, 2002).

In order to provide accurate and confidential sexual health information, many sexual health education services are looking for ways to incorporate technology into their programs. One type of technology involves the use of cell phones. More than three-quarters, 78%, of U.S. teens now have a cellphone (Lenhart, Purcell, Smith, & Zickuhr, 2010; Madden, Lenhart, Duggan, Cortesi, Gasser, 2013). Teens who text spend about an hour and a half sending and receiving text messages each day (Rideout & Foehr, 2010). In addition, the median number of texts messages sent by teens age 12-19 on a typical day has increased from 50 in 2009 to 60 in 2011, with older girls texting the most frequently (Lenhart, 2012). Furthermore, cell phone ownership is relatively high among youth from all races, level of parental education, and household income (Madden, et al., 2013). The nearly ubiquitous use of cell phones and texting provides a novel opportunity to improve access to sexual health education, through text-messaging services.

Three main types of text messaging services are available. One type is an automated service that provides teens with basic information and referrals based on predetermined prompts. An example of this type of service is SEXINFO, implemented in San Francisco, California. In this service, teens opt in and receive a list of codes that they can text for additional information about various topics (Levine, McCright, Dobkin, Woodruff, & Klausner, 2008).

Another type of text messaging service involves participants opting in to receive regular messages related to sexual health. An example of this is one called the Hookup, which sends weekly recommendations and referrals related to sexual health. In 2008, a study of young people aged 16–29 in Melbourne, Australia, found that short text messages about sexual health sent fortnightly for four months significantly increased participants’ knowledge of sexual health (Gold, Lim, Hocking, Keogh, Spelman, & Hellard, 2011).

A third type is a two-way text messaging service, which allows teens to opt-in and then text questions and receive personalized and specific responses. An example of this type of service is BrdsNBz, which currently operates in Indianapolis and Marion County, Indiana; statewide with an additional Parent Text Line in New Mexico; North Carolina; a five-county region around Jacksonville, Florida; and Austin, Texas. The first implementation of this service was launched in 2009 in North Carolina to provide personalized, confidential, and medically accurate answers to questions about sexual health questions and related topics via text message to adolescents aged 14–19 (Anonymous, 2013). Since then, BrdsNBz North Carolina has extended their services to teens aged 13–19 in light of the FTC’s COPPA law (Child Online Privacy Protection Act) that requires adolescents under aged 13–19 to obtain parental consent before submitting information electronically (COPPA).

The question-and-answer format of BrdsNBz keeps adolescents engaged and often leads to follow-up questions. There is no limit to the number of questions teens can ask. In order to participate, teens must first opt in to the service by texting “NCTEEN” to a five-digit short code. In doing so, the teen also agrees to all terms and

conditions of the service. In order to opt out, teens need only to text “STOP” to the same five-digit short code. It is free to use BrdsNBz, although standard text messaging rates may still apply.

The service was initiated in response to the increasing rates of teen pregnancy and sexually transmitted infections (Phillips, 2010). In 2007, more than 20,000 females aged 15 to 19 became pregnant in North Carolina (Phillips, 2010). Since then, teen pregnancy rates have been decreasing in the United States—an 8% decrease in 2011—and in North Carolina, in particular. In 2013, there were 9,145 reported pregnancies in mothers aged 11–19 in North Carolina (North Carolina State Center for Health Statistics, 2013). However, compared with other high-income countries, the United States still has one of the highest teen pregnancy rates. In addition, the transmission of STIs in the United States is also high with about half of all U.S. teens acquiring a STI (Willoughby, 2013b). Furthermore, dating violence continues to remain a serious problem in the U.S., and disproportionately affects younger women; almost half of women who report being raped experience their first rape before the age of 18 (Miller & McCauley, 2013). Therefore, continued research is needed to ensure the positive trajectory of teen pregnancy, STI transmission, and sexual coercion among adolescents.

Several research studies have been conducted about the use of BrdsNBz in North Carolina. One mixed-methods study at the University of North Carolina at Chapel Hill School of Journalism and Mass Communication aimed to identify motivations and barriers for using the BrdsNBz text message service. The study included an electronic questionnaire and in-depth interviews and focus groups of middle and high school students from four schools in North Carolina. Questions were asked about the use of

BrdsNBz, including why people used the service and why not. The researchers found that adolescents trusted the service, found it less awkward or embarrassing to use than other resources, and were also more likely to follow up on answers from BrdsNBz than from other resources (Phillips, 2010; Willoughby, 2013a).

Another study looked at the demographic characteristics of sexual health text message users in North Carolina. This study used an online survey management program with questions pertaining to age, race, gender, and socioeconomic status (SES), pubertal timing, parental monitoring, parental communication about sex, connection to schools, media use, sexual behavior, and use of the BrdsNBz service. This study found that there was no significant difference for gender, academic achievement, pubertal timing, media use, parental communication about sex, or parental monitoring between users and non-users. There was a significant difference, however, for age, with users being slightly older than non-users ($M=14.53$ and $M=14.25$, respectively). It was also found that participants of lower SES were more likely to use the service than participants of higher SES and that users were more likely to feel less connected to school. There was also a significant difference in relationship status with users reporting being in a relationship more often than non-users. Users were also significantly more likely to have had sexual intercourse than non-users (Willoughby, 2013b).

A quantitative content analysis of the first two years of the BrdsNBz NC service found that teens primarily use the service to get information rather than advice about sexual health (Willoughby & Jackson, 2012). Willoughby and Jackson also found the following distribution of questions listed in the textbox to the right. Sub-categories were not mutually exclusive, so percentages sum to greater than 100% (Willoughby & Jackson, 2012).

As of the present date, no mixed-methods content analyses have been processed and published regarding the types of information asked by adolescents using the BrdsNBz NC service. The following analysis adds to previous research by investigating the topics most frequently asked by adolescents aged 13–19 in North Carolina from January 1, 2012, to December 31, 2014.

Objectives

The primary objectives of this study were to identify categories commonly asked about by participants aged 13 to 19 in North Carolina of the BrdsNBz Text Message Warm Line Service, quantify the number of messages from each category, and qualitatively analyze questions regarding sex, development, contraception, pregnancy, STIs, HIV/AIDS, relationships, and sexual identity.

DISTRIBUTION OF QUESTIONS

- Sexual acts, 33.9%
- Unplanned pregnancy, 20.2%
- Contraception, 13.7%
- Development, 12.9%
- STIs, 10.8%
- Masturbation, 2.7%
- HIV/AIDS, 2.4%
- Sexual identity, 2.3%
- Unprotected sex, 1.6%
- Waiting for sex, 1.5%
- Abortion, 0.6%
- Rape/sexual violence, 0.5%
- Others, 13.0%

Methodology

A qualitative content analysis is “used to refer to any qualitative data reduction and sense-making effort that takes a volume of qualitative material and attempts to identify core consistencies and meanings” (Patton, 2001, p. 453). In this study, content analysis was used to determine the questions asked by adolescents to BrdsNBz sexual health text-messaging service in North Carolina. Quantitative methods were also used to understand the frequency of a given topic.

Sample

The sample analyzed by the study consisted of all text messages sent to the BrdsNBz North Carolina from January 1, 2012, to December 31, 2014. Of the 2,171 text messages that were sent, 669 were excluded for being either acknowledgments, non-questions, irrelevant, or inappropriate. Examples of text messages that were excluded for being acknowledgments, non-questions, irrelevant, or inappropriate include texts such as “hi,” “ok,” “thanks,” and “I have a question.” Twenty-two text messages were excluded for asking about sexual technique, as BrdsNBz does not answer questions about sexual technique. Sixty-nine duplicate questions sent more than once by the same user were also excluded from analysis. After exclusions, the sample consisted of 1,411 text messages.

Due to anonymity of the service, no demographic information was available. The University’s Institutional Review Board determined that the project was not within their definition of human subjects research and deemed it exempt from further review because the data were anonymous.

Coding

Only text messages asking questions were coded for the purpose of analysis; all non-questions were excluded from the data set. In many cases, a single question was asked over a series of text messages. In these cases, only one text message was coded, unless more than one question was asked.

Text messages were initially coded deductively and were assigned one of

BrdsNBz Priority Code Areas
<ul style="list-style-type: none">• Contraception• Development• HIV/AIDS• Pregnancy• Relationships• Sex• Sexual Identity• STIs

eight codes, based on the priority areas of BrdsNBz. These codes are listed in the text box to the left. Data that would be excluded (acknowledgment/non-questions/irrelevant/inappropriate, duplicate, and sexual technique) were also coded deductively.

After an initial coding, an expert researcher checked for accuracy.

Text messages coded as contraception, pregnancy, and relationships were sub-coded for emerging themes identified during the first coding process.

Table 1. Codes with corresponding examples

Deductive Codes	Example
Contraception	Are two condoms better than one?
Development	When do periods typically become regular?
HIV/AIDS	What are the signs of HIV/AIDS?
Pregnancy	What are the symptoms of beings pregnant?
Relationships	How do you ask out a girl?
Sex	What's oral sex?
Sexual Identity	How should I tell my parents I'm bisexual?
STI	Is it possible to get an STD even if your partner doesn't have one?

*Additional examples provided in the appendix.

Table 2. Codes with sub-codes and corresponding examples

Code	Sub-codes	Example
Contraception	Birth Control	How do I get birth control without my parents finding out?
	Condom	How do I use a condom?
	Long acting reversible contraception (LARC)	How long does an IUD provide protection for?
	Pills	What is a good birth control pill to get if I'm worried about gaining weight?
	Withdrawal	How effective is the pullout method?
	Other Method	How old do you have to be to get sterilized?
	Resources/referrals	Where can I get free condoms?
	Use	How do you use a female condom?
	Effectiveness	How effective are condoms at preventing pregnancy?
	Protection	How do you prevent a STI?
	Side effects	Can a girl use two hormonal birth control methods without health concerns?
Pregnancy	Prevention	How do you prevent pregnancy?
	Reproduction	How are babies made?
	Risk	If I had unprotected sex yesterday, what is the likelihood I will get pregnant?
	Symptoms	I haven't had my period in two months, could I be pregnant?
	Test	Can I take a pregnancy test while I'm on my period?
	General Information	What is the average age to get pregnant?
	Abortion	Where can I get an abortion?
	Parenthood	Is it hard to have a child?
	Birth	Is childbirth painful?
	Pregnant	How do I tell my mom I'm pregnant?
Relationships	Communication	How do you tell a boy you don't want to have sex with them?
	Dating	How do you keep your boyfriend?
	Love	How do I know I'm in love?
	(Un)healthy Relationships	How do you know if your boyfriend is using you?
	Parents	What if your father doesn't approve of your boyfriend?
	Sexual Coercion	What if my boyfriend pressures me to have sex?

Analytic Methods

All data were analyzed using Microsoft Excel. Several analytic methods were utilized to analyze the data. First, the frequencies and percentages of codes were calculated. Questions coded as contraception, pregnancy, and relationships were sub-coded. The frequency and percentages of these sub-codes were then calculated and translated into pie charts to better understand the weight of each topic. Codes were also qualitatively analyzed by sorting text messages and identifying trends.

Results

Table 3: Codes and frequencies

Code	N	%
Sex	372	26.4%
Development	276	19.6%
Pregnancy	271	19.2%
Contraception	152	10.8%
STI	118	8.4%
Relationships	77	5.5%
Sex/Development	38	2.7%
HIV/AIDS	26	1.8%
Pregnancy/Contraception	21	1.5%
Relationships/Sex	20	1.4%
Sexual Identity	18	1.3%
Development/STI	6	0.4%
Pregnancy/Sex	5	0.4%
Contraception/STI	4	0.3%
Pregnancy/Relationships	3	0.2%
Contraception/Relationships	1	0.1%
Contraception/STI/Pregnancy	1	0.1%
Pregnancy/Sexual Identity	1	0.1%
Relationships/STI	1	0.1%

Sex

There were a total of 2,171 text messages sent during the years 2012, 2013, and 2014. Of these, 760 were excluded from the data set and 1,411 were quantitatively and qualitatively analyzed. The most frequently asked questions were about sex (n= 437, 31%). This is consistent with previous research by Willoughby and Jackson who found about one third of text messages regard sex acts (n=374, 33.9%) (Willoughby & Jackson, 2012). Sex is also the broadest category, encompassing a variety of questions including questions about oral, anal, and vaginal sex as well as other sexual acts. It may also include questions about virginity, orgasms, and pornography. The wide variety of text messages that fall under this category further explains the high frequency of this code type.

Development

Questions regarding development were the second most frequently asked during 2012-2014 (n=320, 22.7%). Puberty begins between 10 and 14 years of age and is marked by many physiological and psychosocial changes. Physical changes include growth of the genitals and pubic hair in males and females, breasts in females, and facial hair in males, as well as the onset of menses in females. In addition, teens experience an increase in sexual interest and attraction and may begin masturbating or having sexual experiences during this time (Delamater & Friedrich, 2002). The data show that teens have questions about these changes, especially with regard to normalcy compared with other teens. For example, 53 questions regarding development were specifically questioning whether something

was normal, OK, or average. Frequently these questions regarded penis or breast size, masturbation, menstruation, or weight.

STIs and HIV/AIDS

STIs and HIV/AIDS combined accounted for 11.1% of the text messages sent to BrdsNBz NC. Many questions asked what HIV/AIDS is and how it is transmitted. There were relatively few questions specifically asking about HIV/AIDS, however, and many more about STIs in general, suggesting that teens are not as concerned about HIV/AIDS as they are about other STIs. Most questions about STIs were about infections in general, rather than about specific infections such as HPV, gonorrhea, or syphilis. Several text messages, however, concerned a fake STI that originated on the Internet.

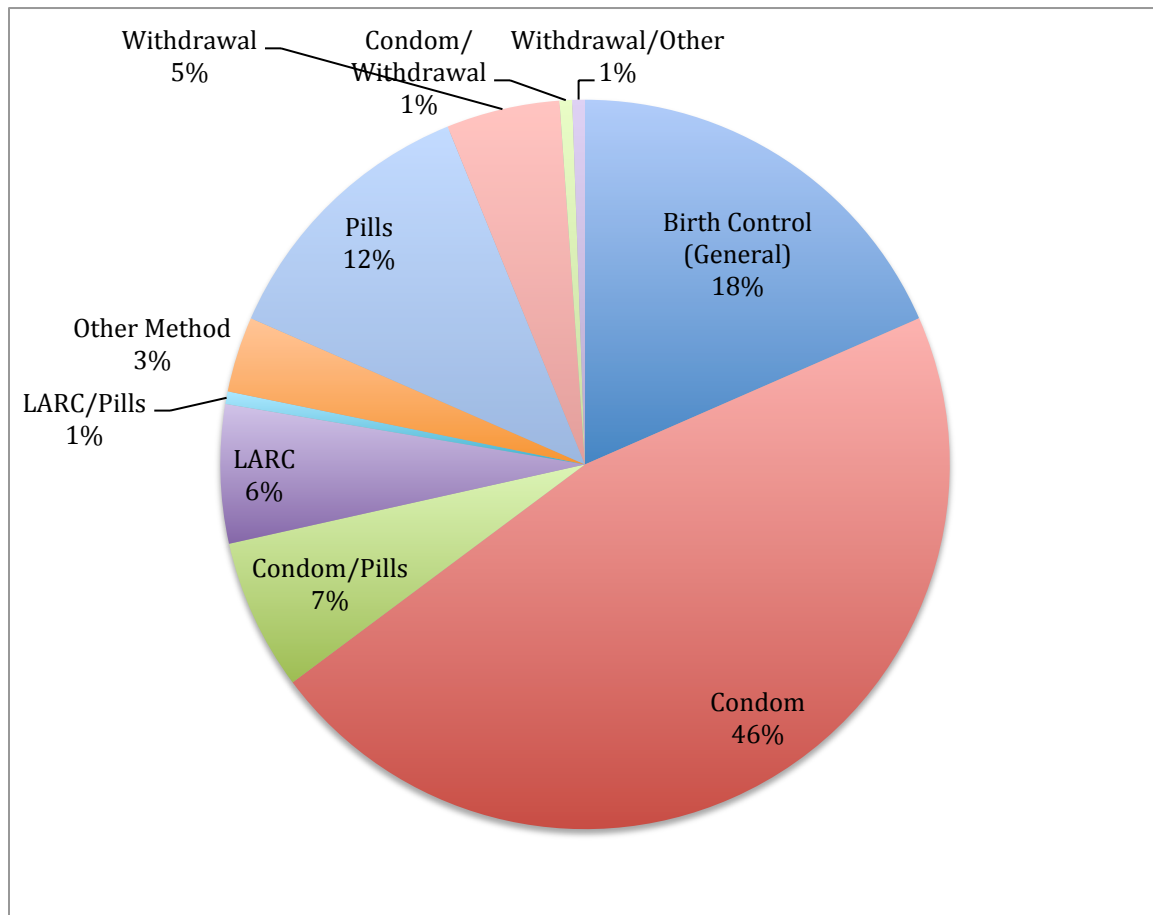
Contraception

Approximately 12.7% of text messages asked about contraception. Text messages coded as contraception were also given sub-codes to further understand what concerns adolescents about contraception. Two types of sub-codes were provided: method and concern. For example, each question was given a sub-code identifying the type of birth control being asked about (pills, condoms, etc.). Another sub-code was given to indicate the user's concern (effectiveness, use, etc.) The method of birth control most frequently asked about was the condom (n=96, 53.6%). Users asked about both male and female condoms as well as the use of condoms with other birth control methods such as the pill. Some of the most

common questions asked included: “How do I put on a condom?” and “Where can I get free condoms?” Also, a subset of questions asked why it was important to use condoms and if it was “OK” to not use condoms in certain situations. Some of these situations included during anal sex, while menstruating, while having sex with a virgin, and if planning to use the “pull-out” method. In these cases, BrdsNBz responded in saying that there is risk with all kinds of sex and that condoms can reduce that risk.

The second most commonly asked questions were about birth control in general. The relative frequency of these questions may have been skewed by the fact that birth control pills are commonly referred to as simply “birth control.” However, because pills were not specified, all questions asking about “birth control” were coded as birth control in general. Eleven of the 33 questions about birth control in general inquired how the user could get birth control without their parents’ knowledge or consent. The third most common contraception question was about birth control pills (n=35, 20%). There were relatively few questions regarding long-acting reversible contraception (LARC) (n=12). Of these, six were about intrauterine devices (IUDs), and six were about injections. Other methods that were mentioned included: emergency contraception (2), sterilization (2), the patch (1), dental dam (1), and the sponge (1). Lastly, the “pull-out” or withdrawal method was asked about 11 times. Most of these questions were concerned with its effectiveness, presumably in pregnancy prevention.

Graph 1: Pie chart of contraception methods sub-codes and percentages



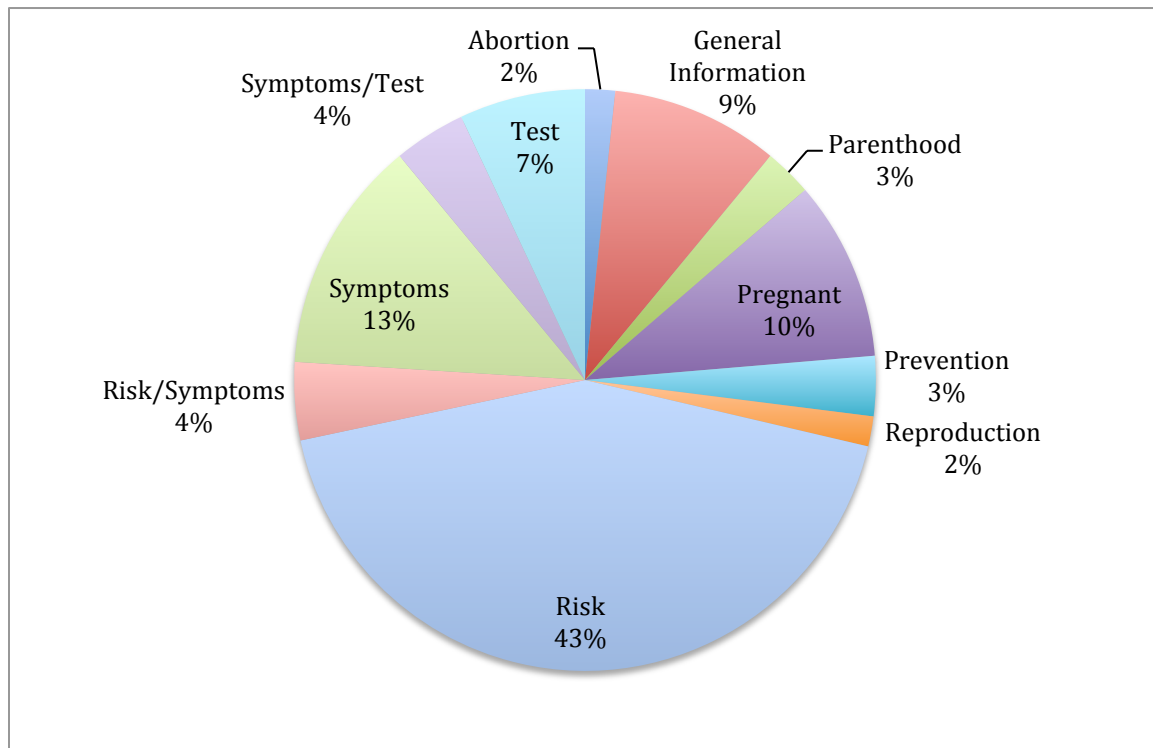
Pregnancy

Twenty-one and half percent of all questions were about pregnancy. The majority of questions about pregnancy regarded the risk of getting pregnant during certain sexual acts (n=142, 47.2%). Most frequently users asked if you could get pregnant: during anal or oral sex, while menstruating, while using birth control, during manual stimulation, in water (hot tubs, pools, etc.), and from pre-ejaculation. The second most commonly asked question regarded pregnancy symptoms (n=64, 21.3%). Questions asking about symptoms were frequently dual-coded as either

Risk/Symptoms or Symptoms/Test. Questions coded as Risk/Symptoms commonly described a sexual situation and then a possible symptom of pregnancy. For example: "I had sex 3 days before my last period, and my period came on time... now a month later I am almost a week late. But I haven't had sex since, could I be pregnant?" Questions coded as Symptoms/Test usually inquired how one would know if she were pregnant or not. Questions were also coded only as symptoms if they were simply asking about symptoms of pregnancy. Questions regarding pregnancy tests only were coded as Test. There were 33 questions total regarding tests: 12 questions coded as Symptoms/Test and 21 questions coded as Test.

About 10% of questions suggested that the user or someone they knew was already pregnant (n=30). However, due to follow-up questions by individual users, there were only 19 unique users who suggested that they or someone they knew was pregnant. Users requested information about care during pregnancy (12), childbirth (2), communicating with parents about the pregnancy (6), normalcy of symptoms (3), and general information (7). It is important to note that it is not possible to know if the user or someone they know is actually pregnant, but that their questions indicate that they are or could be.

Graph 2: Pie chart of pregnancy sub-codes and percentages

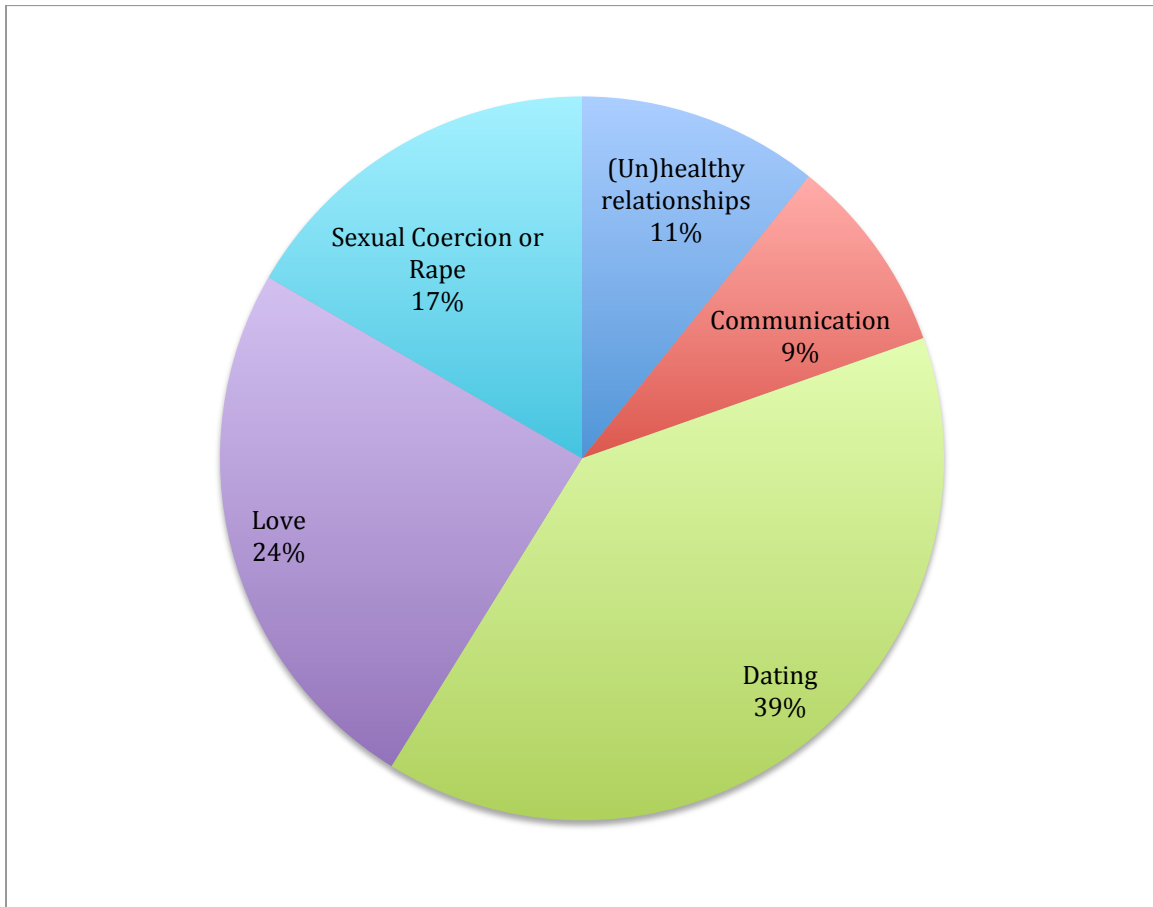


Relationships

Questions regarding relationships were given one of the following codes: (Un)healthy relationships, communication, dating, love, and sexual coercion or rape. Most relationship-type questions regarded dating (n=40, 39%). Examples of dating-type questions include: "How do I ask a girl out?" and "How do I know if a guy likes me?" The second most common relationship code was love (n=25, 24%). Examples of love-type questions include: "Am I in love?" and "How do you know if your (sic) in love?" Sexual coercion or rape was the third most commonly coded text message (n=17, 17%). Of the total text messages coded, sexual coercion or rape is consistent with the findings of Willoughby & Jackson, 1.2% and 0.5% respectively (2012). The remaining text messages were coded as either (un)healthy relationships (n=11) or communication (n=9). However, many dating, love, and sexual coercion or rape

questions could also be coded as communication or (un)healthy relationships due to the generalizability of these codes.

Graph 3: Pie chart of relationship sub-codes

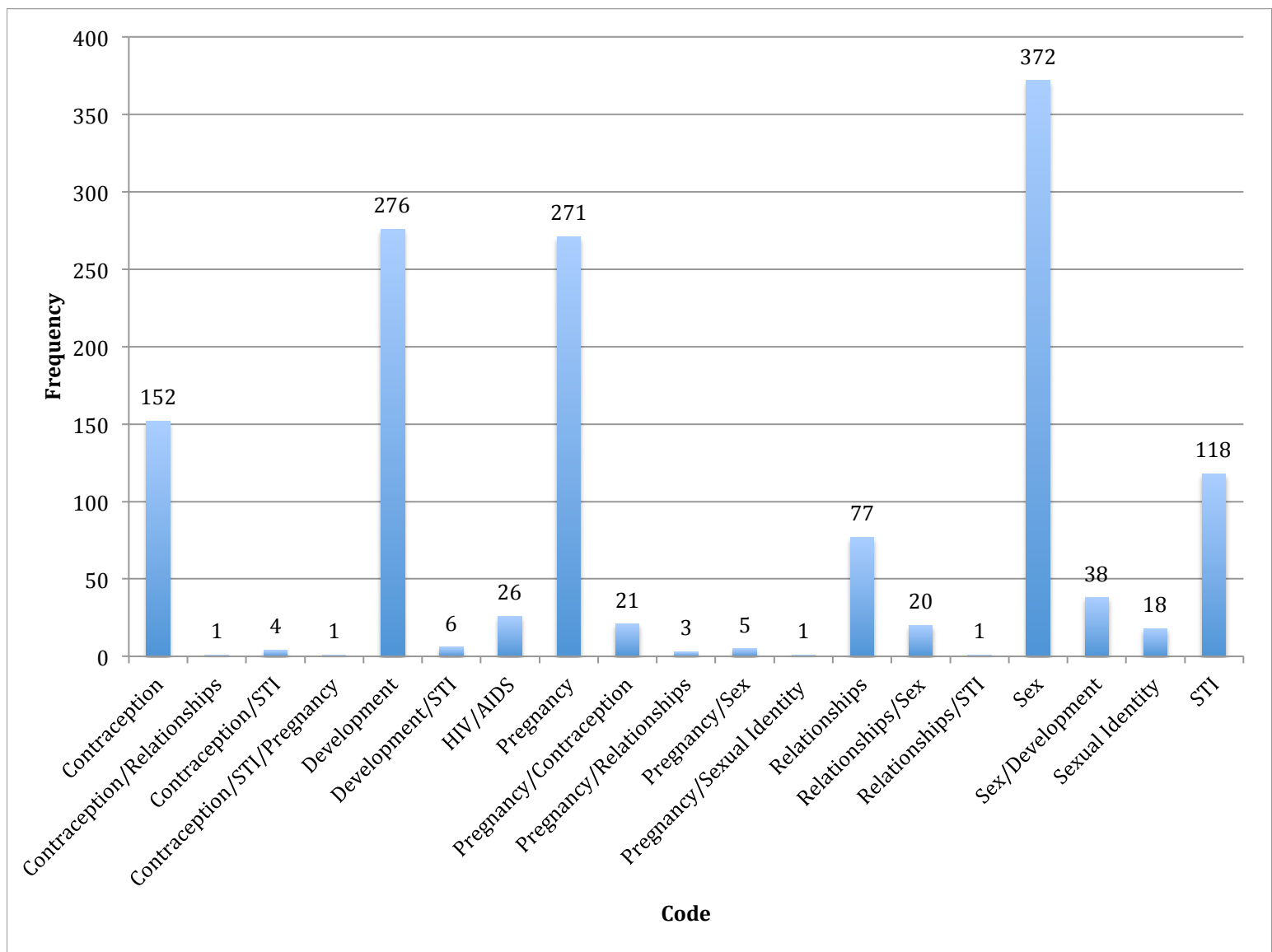


Sexual Identity

Twenty-three questions were coded as sexual identity (1.6%). All of these questions regarded having same-sex attractions. Users were curious about the appropriateness of the attractions and others wanted advice on how to communicate with their parents about their sexual identities. Questions related to heterosexual attractions were not coded under sexual identity, because these

questions were not specifically concerned about their sexual identity. For example, questions related to heterosexual dating were coded as relationships because the user's main concern was about dating, not sexual identity. Coding these questions as sexual identity would have significantly increased the number of questions under this code.

Graph 4: Bar graph of codes and percentages



Discussion

Adolescents have a variety of questions about sexual health. Most frequently teens ask about sexual acts. Teens have questions regarding anal, oral, and vaginal sex as well as genital manipulation, masturbation, and pornography. The wide variety of questions that fall under this category help explain the high frequency of questions. Another possible explanation is that embarrassment may be a significant barrier when seeking information about sexual acts. Also, unlike information about STIs, HIV, and pregnancy, there may not be easily accessible, factually accurate information available on the Internet regarding sexual acts, further explaining the high-frequency questions.

Adolescents also have many questions regarding development, the physical and psychosocial changes that occur during the teen years. Many teens worry that their development is abnormal compared to the average population of adolescents, which may prevent them from seeking information from other teens or adults.

The third most common type of question is pregnancy. Teens generally have questions about risk of pregnancy during certain sexual acts, pregnancy symptoms, and information about pregnancy tests. Many of these questions suggested that the user was already engaging in sexual acts and was therefore concerned about the risk of pregnancy. Furthermore, only eleven questions suggested that the user was male. For example: "If I pull-out than (sic) I won't get anyone pregnant?" was coded as a male user, versus "If I get my period, then I'm not pregnant?" was coded as a female user. There were several questions that could be from either male or female users, such as: "How do you prevent pregnancy?" The data suggests that female

users are more concerned about pregnancy than male users. Therefore, educating teenagers, especially teenage boys, about pregnancy prevention and parenthood may be useful in increasing condom use and reducing teen pregnancy rates.

The fourth most commonly asked questions were about contraception. Teens have questions about a variety of contraceptive methods, but asked most frequently about condoms. Most users who asked about condoms wanted to use them appropriately and effectively. There were a few users who wanted to know why it was important to use condoms during various sexual acts such as during anal or oral sex, while having sex with a virgin, or while menstruating. This demonstrates how BrdsNBz is inclusive of sexual minorities. For example, traditional, heterosexist sexual health programs may not explain that it is important to use condoms during anal sex with same-sex partners because it is assumed that all teens are heterosexual. BrdsNBz on the other hand is user-directed and allows LGBTQ teens to ask if it is important to use condoms with their same-sex partner. This also shows how BrdsNBz helps challenge traditional gender norms by informing teens that pregnancy and STI prevention are the responsibility of both male and female partners.

The second type of birth control most commonly asked about was birth control pills. This suggests that users prefer condoms and pills to other types of birth control methods such as LARCs. Perfect use of birth control pills is more than 99% effective. However, typical use of birth control pills is only 91% effective (BedsiderInsider, 2015). Missing doses is common among birth control pill users; in fact, several BrdsNBz users indicated that they had missed doses. More fail-proof

methods of birth control include LARCs such as the IUD, injections, implants, and rings. The IUD and the implant, for example, are more than 99% effective with perfect and typical use (BedsiderInsider, 2015). Teens may face barriers in acquiring these types of birth control methods. For example, several teens inquired about how to get birth control without their parents' knowledge. The implant and the IUD require a short procedure and, therefore, teens may perceive them being more difficult to acquire without their parents. It may be important to educate teens on the various birth control methods available and explain the risks and benefits of each one.

STIs and HIV/AIDS were the fifth and sixth most commonly coded questions. Users asked more questions about STIs in general and fewer about specific STIs. This may indicate a lack of information provided to teens regarding specific STIs. There were several text messages concerning a fake STI that originated on the Internet. This highlights that teens are regularly seeking information from the Internet that may or may not be reliable, and underscores the need for factually accurate sexual health information available to teens.

The seventh most commonly coded question type was "relationships." Most questions in this category were about love, dating, and communication – both between partners and with parents. The text messages under these codes suggest that teens seek relationships based on love, openness, and mutual respect. There was a smaller subset of the text messages that indicate that teens are in unhealthy or potentially violent relationships. About 17% of relationship text messages suggest that the user has been sexually coerced or raped. This is a small percentage

of the total text messages (1.2%), but it should not be overlooked. Because dating violence disproportionately affects LGBTQ individuals and young women, sexual health education that perpetuates traditional gender norms and excludes LGBTQ youth may contribute to dating violence among teens. Therefore, sexual health education should focus on deconstructing gender norms and being inclusive of sexual minorities.

Lastly, teens inquired about sexual identity. All questions regarding sexual identity indicated the user was attracted to the same sex. Questions regarding heterosexual relationships were not coded as sexual identity because the user was not concerned with their sexual identity but with some aspect of the relationship, (i.e., pregnancy, STIs, sexual coercion, love, etc.). This indicates that LGBTQ youth are more concerned about their sexual identity than heterosexual youth. Sexual health educators should support LGBTQ youth and aim to break hetero-normative beliefs.

In conclusion, teens have questions about sexual health, development, and relationships and may feel uncomfortable asking these questions to adults. The Internet, while confidential and readily accessible, is often unreliable. BrdsNBz fills this information gap by providing confidential, factually accurate, sexual health information. Moreover, it is user-directed and, in this way, inclusive of all teens regardless of sexual attraction or gender.

Limitations and future research

Due to the anonymity of the service, demographic information was not included in the data set. Furthermore, not only was it impossible to identify who was sending the text messages, the extent to which adults were using the service instead of adolescents is unknown. However, by sending the “NCTEEN” keyword to the BrdsNBz Text Line the user receives an automatic text message response linking him or her to the Terms and Conditions of Use for BrdsNBz NC. The Terms and Conditions of Use state, “... by opting in to BrdsNBz NC – the user agrees that he or she is aged 13 to 19 and resides in North Carolina.” Lastly, it is unclear if users are actually using the information they receive. Future research should analyze BrdsNBz users’ knowledge of sexual health information.

Acknowledgments

The author thanks BrdsNBz North Carolina Text Line for providing this information. She also thanks the organization’s representative, Kennon Jackson, Jr., and advisor, Claudia Fernandez, DrPH, for their support and guidance on this project.

Code Book

1. **Acknowledgment/Non-questions/Irrelevant/Inappropriate**- Includes all non-questions and irrelevant or inappropriate questions. Does not include questions about sexual technique. EXAMPLES: Hi. I have a question. Thanks. I am pregnant. How do you have sex?
2. **Contraception** – Includes questions regarding use, reliability, and accessibility of various forms of contraception. Also includes general questions about contraceptive methods. EXAMPLES: Are two condoms better than one? What if the condom rips? Where do you go to get girl condoms?
3. **Development** – Includes questions regarding menstruation, puberty, masturbation, and other physical conditions associated with sex characteristics (acne, pubic hair, genitalia, etc.) during development. Also includes questions about age of sexual debut. EXAMPLES: Can a girl get pimples on her vagina? When do periods typically become regular? How do you know you're ready for sex? Is my penis too small?
4. **HIV/AIDS** – Includes questions about HIV/AIDS. EXAMPLES: What are the signs of HIV/AIDS? Can a baby be born with HIV/AIDS?
5. **Pregnancy** – Includes questions regarding pregnancy. EXAMPLES: What are the symptoms of beings pregnant? How do I tell my parents I'm pregnant?
6. **Relationships** – Includes questions regarding romantic and intimate relationships. EXAMPLES: How do you ask out a girl? What should I do if I have a boyfriend who pressures me?
7. **Resources/Referrals** – Includes all questions requesting resources, referrals, or additional information. EXAMPLES: Where can I get more information on safe sex? Where can I get free condoms? Where can I get tested?
8. **Sex** – Includes questions about anal, oral, vaginal sex or genital stimulation. Includes questions about virginity or sexual debut. Also includes questions pertaining to masturbation and other sexual activity. EXAMPLES: What's oral sex? Is it bad to swallow semen? What does sex feel like? How do you know when you're ready to have sex? What is a BJ?
9. **Sexual Technique** – (BrdsNBz DOES NOT ANSWER QUESTIONS ABOUT SEXUAL TECHNIQUE) EXAMPLES: My partner wants me to entertain him. What should I do? How do you give a blowjob?

10. **Sexual Identity** – Includes questions about sexual orientation or gender identification. EXAMPLES: How should I tell my parents I’m bisexual? How do I know if I’m gay?
11. **STI** – Includes all questions regarding STIs or STDs and yeast infections. Does not include questions specifically about HIV/AIDS. EXAMPLES: Is it possible to get an STD even if your partner doesn’t have one? Do you have to go have sex a number of times to get a certain STI? It burns when I pee after having unprotected sex, do I have an STD?

Dual codes:

12. **Contraception/Relationships** – Includes questions regarding both contraception and relationships. EXAMPLES: How do you get your boyfriend to use condoms?
13. **Contraception/STI** – Includes questions regarding prevention of STIs through condom use. EXAMPLES: Do condoms prevent all STDs?
14. **Contraception/STI/Pregnancy** – Includes questions regarding contraception, STIs, and pregnancy. EXAMPLES: What are the chances of getting pregnant or a STI if you use a condom?
15. **Development/STI** – Includes questions regarding symptoms of puberty or STIs, but the inquirer does not know the source of the symptoms. EXAMPLES: “Is it normal to have bumps on your pubic area?” “What color should your discharge be?”
16. **Sex/Development** – Includes questions related to sexual debut. EXAMPLES: When should I have sex? How do I know I’m ready for sex?
17. **Pregnancy/Contraception** – Includes questions related to both contraception and pregnancy. EXAMPLES: If a condom breaks, can I get pregnant? If I miss a day of my pills, will I get pregnant?
18. **Pregnancy/Relationships** – Includes questions related to both pregnancy and relationships. EXAMPLES: How do I tell my boyfriend I’m pregnant?
19. **Pregnancy/Sex** – Includes questions regarding performing sexual acts while pregnant. EXAMPLES: Can I have sex while pregnant?
20. **Pregnancy/Sexual Identity** – Includes questions regarding both pregnancy and sexual identity.

21. **Relationships/Sex** – Includes questions related to communicating about sex with intimate partners. EXAMPLES: My boyfriend wants to have sex and I don't want to. What should I do?
22. **Relationships/STI** – Includes questions related to both relationships and STIs. EXAMPLES: How do I tell my girlfriend I have a STD?
23. **Sex/Development** – Includes questions related to when it is appropriate to start engaging in sexual activity. EXAMPLES: What is a good age to have sex? How can you delay sexual involvement? What is the age most kids start having intercourse?

Sub-codes:

Contraception sub-codes:

1. **Birth Control** – Includes questions that ask about birth control in general and do not specify which type of birth control method. EXAMPLES: Where do you get birth control? What are the negative effects of birth control?
2. **Condoms** – Includes questions about either male or female condoms. In most cases, questions that did not specify which type of condom were considered to be questions about male condoms. EXAMPLES: Are two condoms better than one? What is the best brand of condom? Do latex condoms provide protection against STDs and pregnancy? How do you use a female condom?
3. **LARC** – Includes questions regarding long acting reversible contraceptives (LARCs) including: IUDs, injections, implants, and the Nuva Ring. EXAMPLES: How long does an IUD provide protection for? How long does it take for an injection to work?
4. **Other method** – Includes questions regarding other methods other than condoms, LARCs, pills, and withdrawal. These may include: patches, emergency contraception, sterilization, and various barrier methods. EXAMPLES: How effective is the Today Sponge? Where can I get emergency contraception?
5. **Pills** – Includes questions regarding birth control pills. EXAMPLES: What is a good birth control pill if I'm worried about gaining weight? Where can I get birth control pills?
6. **Withdrawal** – Includes questions about the withdrawal or "pull-out" method. EXAMPLES: How effective is the pull-out method? Is it true that if I pull out I won't get anyone pregnant?

7. **Effectiveness** – Includes questions regarding the effectiveness of a given contraceptive method. EXAMPLES: How effective is the pull-out method? If I use condoms and birth control pills, will I not get pregnant?
8. **General Information** – Includes questions requesting information about contraception in general. EXAMPLES: What is birth control? Is there a girl condom?
9. **Protection** – Includes questions regarding the purpose of contraception. EXAMPLES: Why is it important to protect yourself? Is it OK to not use a condom during anal sex?
10. **Resources/Referrals** – Includes questions regarding accessing further information, resources, or referrals. EXAMPLES: Where can I get free condoms? Where can I get birth control without my parents knowing?
11. **Side effects** – Includes questions regarding side effects of a specific contraceptive method. EXAMPLES: What is a good birth control pill if I'm worried about gaining weight? What are the negative side effects of birth control?
12. **Use** – Includes questions regarding how to use a specific contraceptive method. EXAMPLES: How do I put on a condom? If I miss a day of my birth control pills, what should I do?

Pregnancy sub-codes:

1. **Abortion** – Includes questions that inquire about abortion. EXAMPLES: Is abortion legal in the US? Where can I get an abortion?
2. **General Information** – Includes questions requesting information about pregnancy in general. EXAMPLES: What is a stillbirth? What state has the most teen pregnancies? What is the youngest age someone has ever gotten pregnant?
3. **Parenthood** – Includes questions about being a parent and birth. EXAMPLES: Would a baby be hard to take care of? How much does it cost to have a baby?
4. **Pregnant** – Includes questions indicating that the user may be pregnant. EXAMPLES: How to I tell my mom I'm pregnant? I'm pregnant. What should I do?

5. **Prevention** – Includes questions about preventing pregnancy in general. EXAMPLES: How do I stop from getting pregnant? How to I prevent pregnancy?
6. **Reproduction** – Includes questions about reproduction. EXAMPLES: Where do babies come from? Who decides the sex of a baby? How are twins formed?
7. **Risk** – Includes questions about risk of pregnancy in relation to certain sexual acts. EXAMPLES: Can you get pregnant in a hot tub? Can you get pregnant during anal sex?
8. **Symptoms** – Includes questions inquiring about pregnancy symptoms. EXAMPLES: I am five days late on my period, could I be pregnant? I have been peeing a lot, could I be pregnant?
9. **Test** – Includes questions regarding pregnancy tests. EXAMPLES: Do you have to be 18 to buy pregnancy tests? Can I take a pregnancy test when on my period? What do I do if I think I'm pregnant?

Relationship sub-codes:

1. **(Un)healthy relationships** – Includes questions that suggest an unhealthy relationship or how to have a healthy relationship. EXAMPLES: How do you know if a boy is using you? How are you supposed to treat a woman?
2. **Communication** – Include questions about how to communicate with romantic partners. EXAMPLES: How do you tell your boyfriend you have an STD? How do you tell a boy you don't want to have sex with them?
3. **Dating** – Includes questions about dating. EXAMPLES: How do I know if a guy likes me? How do you keep your boyfriend?
4. **Love** – Includes questions that inquire about love. EXAMPLES: What is love? How do I know if I'm in love?
5. **Sexual Coercion or Rape** – Includes questions suggesting sexual violence, coercion, or rape. EXAMPLES: How would you know if you're being sexually abused? What if my boyfriend pressures me into having sex?

References

1. Ackard, D. M., & Neumark-Sztainer, D. (2001). Health care information sources for adolescents: Age and gender differences on use, concerns, and needs. *Journal of Adolescent Health, 29*(3), 170-176. doi:10.1016/S1054-139X(01)00253-1
2. Anonymous. (2013). Technology holds the key -- help young women pick prevention options. *Contraceptive Technology Update, 34*(11), 121.
3. BedsiderInsider. (2015). The pill. Retrieved from http://bedsider.org/methods/the_pill#details_tab
4. Centers for Disease Control and Prevention. (2006). Physical dating violence among high school students-United States, 2003. *Morbidity and Mortality Weekly Report, 61*(47), 971-976.
5. Centers for Disease Control and Prevention. (2013). Incidence prevalence, and cost of sexually transmitted infections in the United States. Retrieved from <http://www.cdc.gov/std/stats/sti-estimates-fact-sheet-feb-2013.pdf>.
6. Centers for Disease Control and Prevention. (2014). Sexual violence: Consequences. Retrieved from <http://www.cdc.gov/violenceprevention/sexualviolence/consequences.html>
7. COPPA – Children’s Online Privacy Protection Act. Title XIII-Children’s online privacy protection. Retrieved from <http://www.coppa.org/coppa.htm>
8. DeLamater, J., & Friedrich, W. N. (2002). Human sexual development. *The Journal of Sex Research, 39*(1), 10-14.
9. Gold, J., Lim, M. S. C., Hocking, J. S., Keogh, L. A., Spelman, T., & Hellard, M. E. (2011). Determining the impact of text messaging for sexual health promotion

- to young people. *Sexually Transmitted Diseases*, 38(4), 247-252.
doi:10.1097/OLQ.0b013e3181f68d7b
10. Lenhart, A. (2012). Teens, smartphones, & texting. Pew Research Center's Internet & American Life Project. Retrieved from
http://www.pewinternet.org/files/old-media/Files/Reports/2012/PIP_Teens_Smartphones_and_Texting.pdf
 11. Lenhart, A., Purcell, K., Smith, A., & Zickuhr, K. (2010). Social media & mobile internet use among teens and young adults. Pew Research Center's Internet & American Life Project (1-51).
 12. Levine, D., McCright, J., Dobkin, L., Woodruff, A. J., & Klausner, J. D. (2008). SEXINFO: A sexual health text messaging service for San Francisco youth. *American Journal of Public Health*, 98(3), 393-395.
doi:10.2105/AJPH.2007.110767
 13. Madden, M., Lenhart, A., Duggan, M., Cortesi, S., & Gasser, U. (2013). *Teens and technology, 2013*
 14. Miller, E., & McCauley, H. L. (2013). Adolescent relationship abuse and reproductive and sexual coercion among teens. *Current Opinion in Obstetrics & Gynecology*, 25(5), 364-369. doi:10.1097/GCO.0b013e328364ecab
 15. National Research Council (2013). *U.S. Health in international perspective: Shorter lives, poorer health*. Washington, DC: National Academy Press.
 16. North Carolina State Center for Health Statistics. (2013). Basic automated birth yearbook North Carolina residents, 2013. Retrieved from:
<http://www.schs.state.nc.us/schs/births/babybook/2013/northcarolina.pdf>

17. Ott, M. A., & Santelli, J.S. (2007). Abstinence and abstinence-only education. *Current Opinion in Obstetrics and Gynecology*, 19(5). 445-452.
doi:10.1097/GCO.0b013e3282efdc0b
18. Patton, G. C., & Viner, R. (2007). Pubertal transitions in health. *The Lancet*, 369(9567), 1130-1139. doi:10.1016/S0140-6736(07)60366-3
19. Patton, M. Q. *Qualitative research & evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage Publications, Inc.
20. Perry, R. C. W., Kayekjian, K. C., Braun, R. A., Cantu, M., Sheoran, B., & Chung, P. J. (2012). Adolescents' perspectives on the use of a text messaging service for preventive sexual health promotion. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, 51(3), 220-225.
doi:10.1016/j.jadohealth.2011.11.012
21. Phillips, K. R. (2010). BrdsNBz: A text-messaging forum for improving the sexual health of adolescents in North Carolina. *North Carolina Medical Journal*, 71(4), 368-371.
22. Rideout, V. (2002). Generation Rx.com. *Marketing Health Services*, 22(1), 26-30.
23. Rideout, V. J., Foehr, U. G., & Roberts, D. F. (2010). Generation M2: Media in the lives of 8-to 18-year-olds (Vol. 54). Menlo Park, Ca: Henry J. Kaiser Family Foundation.
24. Shalet, A.T., Santelli, J.S., Russell, S.T., Halpern, C.T., Miller, S.A., Pickering, S.S., Goldberg, S.K., & Hoening, J.M. (2014). Invented commentary: Broadening the evidence for adolescent sexual and reproductive health and education in the United States. *Journal of Youth Adolescence*, 43, 1595-1610.

doi:10.1007/s10964-014-0178-8

25. Stranger-Hall, K.F., & Hall, D.W. (2011). Abstinence-only education and teen pregnancy rates: Why we need comprehensive sex education in the U.S. *PLoS ONE*, 6(10), doi:10.1371/journal.pone.0024658
26. Weinstock, H., Berman, S., & Cates, W. (2004). Sexually transmitted diseases among American youth: Incidence and prevalence estimates, 2000. *Perspectives on sexual and reproductive health*, 36(1), 6-10.
27. Willoughby, J. F. (2013a). BrdsNBz: A mixed methods study exploring adolescents' use of a sexual health text message service. ProQuest, UMI Dissertations Publishing.
28. Willoughby, J. F. (2013b). Everyone has questions: Developing a social marketing campaign promoting a sexual health text message service. *Social Marketing Quarterly*, 19(4), 265-278. doi:10.1177/1524500413505570
29. Willoughby, J. F., & Jackson, K. (2012). 'Can you get pregnant when u r in the pool?': Young people's information seeking from a sexual health text line. *Sex Education*, 1-11. doi:10.1080/14681811.2012.677746
30. World Health Organization. (1946). Constitution of the World Health Organization as adopted by the International Health Conference. *Official Records of the World Health Organization*, 2, 100.